

**REMARKS**

**I. INTRODUCTION**

Claims 14, 15 and 21-27 have been amended. Accordingly, claims 14-27, 42, 43, 73 and 74 are now under consideration in the present application. Provided above, please find a claim listing indicating the claim amendments, and current status of the claims on separate sheets so as to comply with the requirements set forth in 37 C.F.R. § 1.121. It is respectfully submitted that no new matter has been added.

**II. REJECTIONS UNDER 35 U.S.C. § 103(a) SHOULD BE WITHDRAWN**

Claims 14-27 and 73-74 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 3,969,274 issued to Frampton (hereinafter "Frampton"). Claims 42 and 43 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Frampton in view of U.S. Patent No. 4,544,674 issued to Fiato et al. (hereinafter "Fiato"). Claims 14, 15, 18, 19, 21, 22, 73 and 74 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,073,661 issued to Scheffer et al. (hereinafter "Scheffer"). Claims 16, 17, 20, 23, 24 and 27 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Scheffer in view of Frampton. For at least the reasons set forth herein below, Applicants respectfully assert that amended independent claims 14 and 15, and the claims which depend therefrom, are not rendered obvious by Frampton or Scheffer, or rendered obvious by the alleged combination of Frampton with Fiato or Scheffer.

“To reject claims in an application under Section 103, an examiner must show an unrebutted *prima facie* case of obviousness.” *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998). The Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), stated:

Under Section 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

Indeed, to sustain a rejection under 35 U.S.C. § 103(a), there must be some teaching, other than the instant application, to alter the prior art to arrive at the claimed invention. “The problem confronted by the inventor must be considered in determining whether it would have been obvious to combine the references in order to solve the problem.” *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679 (Fed. Cir. 1998).

The objective standard for determining obviousness under 35 U.S.C. § 103, as set forth in *Graham v. John Deere, Co.*, 383 U.S. 1 (1966), requires a factual determination to ascertain: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; and (3) the differences between the claimed subject matter and the prior art. Based on these factual inquiries, it must then be determined, as a matter of law, whether or not the claimed subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the alleged invention was made. *Graham*, 383 U.S. at 17. Courts have held that there must be some suggestion, motivation or teaching of the desirability of making the combination claimed by the applicant (the “TSM test”). See *In re Beattie*, 974 F.2d 1309, 1311-12 (Fed. Cir. 1992). This suggestion or motivation may be derived from the prior art itself, including references or

disclosures that are known to be of special interest or importance in the field, or from the nature of the problem to be solved. *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996).

Although the Supreme Court criticized the Federal Circuit's application of the TSM test, see *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, (2007) the Court also indicated that the TSM test is not inconsistent with the *Graham* analysis recited in the *Graham v. John Deere* decision. *Id.*; see *In re Translogic Technology, Inc.*, No. 2006-1192, 2007 U.S. App. LEXIS 23969, \*21 (October 12, 2007). Further, the Court underscored that "it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR*, 127 S. Ct. at 1741. Under the precedent established in *KSR*, however, the presence or absence of a teaching, suggestion, or motivation to make the claimed invention is merely one factor that may be weighed during the obviousness determination. *Id.* Accordingly, the TSM test should be applied from the perspective of a person of ordinary skill in the art and not the patentee, but that person is creative and not an automaton, constrained by a rigid framework. *Id.* at 1742. However, "the reference[s] must be viewed without the benefit of hindsight afforded to the disclosure." *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994).

The prior art cited in an obviousness determination should create a reasonable expectation, but not an absolute prediction, of success in producing the claimed invention. *In re O'Farrell*, 853 F.2d. 894, 903-04 (Fed. Cir. 1988). Both the suggestion and the expectation of success must be in the prior art, not in applicant's disclosure. *Amgen, Inc. v. Chugai Pharmaceutical Co., Ltd.*, 927 F.2d 1200, 1207 (Fed.

Cir. 1991) (citing *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988)). Further, the implicit and inherent teachings of a prior art reference may be considered under a Section 103 analysis. See *In re Napier*, 55 F.3d 610, 613 (Fed. Cir. 1995).

Secondary considerations such as commercial success, long-felt but unsolved needs, failure of others, and unexpected results, if present, can also be considered. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538-39 (Fed. Cir. 1983). Although these factors can be considered, they do not control the obviousness conclusion. *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 768 (Fed. Cir. 1988).

To establish obviousness, the prior art references must be evaluated as a whole for what they fairly teach and neither the references' general nor specific teachings may be ignored. *Application of Lundsford*, 357 F.2d. 385, 389-90 (CCPA 1966). A reference must be considered for all that it teaches, not just what purportedly points toward the invention but also that which teaches away from the invention. *Ashland Oil, Inc. v. Delta Resins & Refractories*, 776 F.2d. 281, 296 (Fed. Cir. 1985).

Independent claims 14 and 15 have been amended to recite a catalyst that has characteristics that facilitate a production of hydrocarbon from a syngas in a slurry bed.

Frampton, on the other hand, only describes a fixed bed catalyst which includes an active catalyst material supported on a particular type of porous silica xerogel, which has been treated with steam under particular temperature conditions. (See Frampton, Abstract). Frampton describes (1) the oxidation of ethylene to acetic acid, (2) the oxidation of ethylene in the presence of acetic acid to vinyl acetate, (3) the oxidation of propylene in the presence of water to acrylic acid, (4) the oxidation of

xylene to the corresponding aromatic acids, e.g., phthalic, isophthalic, or terephthalic acids, (5) the ammonia oxidation of propene to acrylonitrile, (6) the oxidative dehydrogenation of n-butylene, (7) the reductive amination of nitriles, (8) the oxidation of exhaust gas from internal combustion engines, (9) the hydrogenation of unsaturated compounds, (10) olefin polymerization, (11) oxidation of paraffin hydrocarbons, (12) oxidation of SO<sub>2</sub> to SO<sub>3</sub>, (13) the hydrogenation of phenol to cyclohexanol, (14) oxosynthesis, (15) hydrogenation of nitroso compounds, and (16) the oxidation of ethanol to acetic acid. (See Frampton, col. 4, ln. 53 – col. 5, ln. 3).

Indeed, Frampton fails to disclose **a catalyst that has characteristics that facilitate a production of hydrocarbon from a syngas in a slurry bed**, as recited in amended independent claims 14 and 15. It is respectfully asserted that there is absolutely no teaching, suggestion or motivation discussed in Frampton to use the fixed bed catalyst in a slurry bed.

Scheffer describes a process for the preparation of hydrocarbons, wherein a feed comprising methanol is contacted at reaction conditions with a catalyst comprising: (i) a porous carrier material selected from the group comprising silica, alumina, and mixtures thereof; (ii) cobalt as a metal component deposited on the porous carrier material; and (iii) a promoter selected from the group comprising zirconium, titanium, chromium, ruthenium, iron, magnesium, zinc, thorium and uranium. (See Scheffer, Abstract). However, Scheffer also fails to teach or suggest **a catalyst that has characteristics that facilitate a production of hydrocarbon from a syngas in a slurry bed**, as recited in amended independent claims 14 and 15.

Further, amended independent claims 14 and 15 recite a catalyst support on which cobalt is loaded, wherein an alkali metal content or an alkaline-earth metal content in the catalyst support is in a range of approximately 0.01 mass% to 0.07 mass% (See claim 14) or 0.01 mass% to 0.04 mass% (See claim 15).

As provided in the specification and Fig. 1, the CO conversion can be remarkably increased (40% or more) when an alkali metal or an alkaline-earth metal content in the catalyst support is in the range of approximately 0.01 mass% to 0.07 mass% or 0.01 mass% to 0.04 mass% (See, e.g., specification, para. [0025]). In contrast, Frampton and Scheffer fail to teach or suggest how reaction activity changes when a catalyst is used. Moreover, Frampton and Scheffer fail to teach or suggest that reaction activity increases when an alkali metal or an alkaline-earth metal content is 700 ppm (0.07 mass%) or less, and 400 ppm (0.04 mass%) or less. It is respectfully asserted that there is no teaching, suggestion or motivation discussed in Frampton or Scheffer to provide this range to increase the CO conversion.

A presumption of obviousness can be rebutted by evidence that: (1) prior art taught away from claimed invention, or (2) that there are new and unexpected results relative to prior art. *Iron Grip Barbell Co., Inc. v. USA Sports, Inc.*, 392 F.3d 1317 (Fed.Cir. 2004).

As shown in Fig. 1 and described in the specification of the present application, and particularly in paragraph [0025] thereof, the CO conversion dramatically increases when an alkali metal content or an alkaline-earth metal content in the catalyst support is in a range of approximately 0.01 mass% to 0.07 mass%, or 0.01 mass% to 0.04 mass%, as set out in amended independent claims 14 and 15, respectively.

Accordingly, Applicants respectfully submit that Frampton and Scheffer fail to teach or suggest the recitations of amended independent claims 14 and 15 as required by 35 U.S.C. § 103.

Regarding the 35 U.S.C. § 103(a) rejections of the dependent claims, Applicant respectfully asserts that Frampton or Scheffer fail to teach or suggest the explicit recitations of independent claims 14 and 15, as amended herein. Accordingly, the claims which depend from such amended independent claims 14 and 15 are also patentable over Frampton and Scheffer, or by the combination of Frampton with Fiato and/or Scheffer, at least because these publications fail to teach or suggest the features of amended independent claims 14 and 15.

Claims 21-27 recite that the catalyst support has a diameter in a range of approximately 20µm to 250µm. Frampton only describes that the particles can have a diameter of the order of 100 Å (See Frampton, Col. 6, Ins. 15-18), and Scheffer only describes that the particles can have a nominal diameter of 0.5 – 5 mm, and preferably 1 -2 mm (See Scheffer, Col. 4, Ins. 37-39). Accordingly, Frampton and Scheffer both fail to teach or suggest that the catalyst support has a diameter in a range of approximately 20µm to 250µm, as recited in claims 21-27.

Further, claims 73 and 74 recite that the CO conversion is 40% or more. However, Frampton, Scheffer and Fiato, taken individually or in combination, fail to teach or suggest that the CO conversion is 40% or more when using cobalt on the catalyst support.

Therefore, for at least the reasons as presented herein above, Applicants respectfully request withdrawal of the 35 U.S.C. § 103(a) rejection of claims 14-27 and

73-74 as allegedly being unpatentable over Frampton, the 35 U.S.C. § 103(a) rejection of claims 42 and 43 as allegedly being unpatentable over Frampton in view of Fiato, the 35 U.S.C. § 103(a) rejection of claims 14, 15, 18, 19, 21, 22, 73 and 74 as allegedly being unpatentable over Scheffer, and the 35 U.S.C. § 103(a) rejection of claims 16, 17, 20, 23, 24 and 27 as allegedly being unpatentable over Scheffer in view of Frampton.

### III. CONCLUSION

In light of the foregoing, Applicants respectfully submit that pending claims 14-27, 42, 43, 73 and 74 are in condition for allowance. Prompt consideration, reconsideration and allowance of the present application are therefore earnestly solicited. If any issues remain outstanding, the Examiner is invited to contact the undersigned via the telephone number provided below.

Respectfully submitted,

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By: \_\_\_\_\_

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